

21



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/614,945	07/07/2003	Shuijun Lu	ARC-P123	9094
32566	7590	04/19/2005	EXAMINER	
PATENT LAW GROUP LLP 2635 NORTH FIRST STREET SUITE 223 SAN JOSE, CA 95134			WOODS, ERIC V	
			ART UNIT	PAPER NUMBER
			2672	

DATE MAILED: 04/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/614,945	<b>Applicant(s)</b> LU, SHUIJUN	
	<b>Examiner</b> Eric V Woods	<b>Art Unit</b> 2672	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 07 July 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some    \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date: _____.   |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date: _____.   | 6) <input type="checkbox"/> Other: _____.                                   |

## DETAILED ACTION

### *Inventorship and Requirements to Applicant*

The inventor "Shiujin Lu" on this application is the only listed inventor of the instant application (10/614,945). Examiner found after an assignee search of the instant application that the assignee, e.g. Arcsoft, Inc., has filed three other applications having the same filing date of 07 July 2003, those applications being 10/614,879, 10/614,883, which has issued as US Patent 6,876,366, and 10/614,876. Further, these applications have inventorship as follows:

10/614,876: Dongren Chin, Jiangen Cao

10/614,879: Jiangen Cao

10/614,883: Dongren Chin

10/614,945: Shiujin Lu

Examiner further observes that these applications have identical specifications, and the claims of applications 10/614,883 and particularly 10/614,879 are similar to those of the instant application. Therefore, it would appear that inventorship would be common between 10/614,883 and 10/614,945 and further between 10/614,879 and 10/614,945, but that is not claimed, particularly the applications of 10/614,879 and 10/614,945, as the claimed subject matter appears to be very similar.

Applicant is reminded of 37 CFR 1.56, that being the duty to disclose [MPEP 2001] with respect to co-pending applications and inventorship. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim

\*\* Applicant is required to amend the specification of the instant application on the first page to note the concurrently filed application, and their status, as well as the other relevant applications.

\*\* Applicant is thusly required to clarify the situation with regards to the inventorship of the current applications. Please note that an incomplete response to this situation will be treated as non-responsive, with the consequences as set forth in the MPEP for non-responsive amendments, and would be noted as such.

### ***Specification***

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### ***Drawings***

Examiner accepts the drawings.

### ***Claim Objections***

Claim 3 is objected to because of the following informalities: It should be dependent upon claim 2, not claim 3, as illustrated by the recitation of certain items "the second parameter" for example that would otherwise lack antecedent basis. Correcting this problem would also result in the withdrawal of the rejection under 35 USC 112, second paragraph below. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3 recites the limitation "the second parameter" in lines 8 and 9. There is insufficient antecedent basis for this limitation in the claim.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Crisu et al (US PGPub 2004/0207642 A1)('Crisu') in view of Foley et al (Foley, J. et al. "Computer Graphics: Principles and Practice").

As to claim 1,

A method for determining fill style for pixels in a scan line, the scan line comprising a first pixel having edges and a second pixel without any edges, the method comprising: (First of all, a computer graphics system that draws edges will inherently have pixels that are crossed by edges and ones that are not, e.g. Crisu [0013-0016] wherein Fig. 1a and 3b)(Foley Fig. 3.4 on page 73, Fig. 3.5 on page 74, et cetera, which show pixels being crossed by edges and others not)

-For each edge in the first pixel: (Crisu clearly teaches the use of edge filling algorithms that have such first pixels, e.g. see Figs. 1-3 and the others in that PGPub)(Foley clearly shows in Figs. 3.4, 3.5, etc. that such first pixels exist)

-Determining if each edge touches a bottom border of the first pixel; (Foley clearly shows that in the explanation of the operation of the Bresenham algorithm on page 74 that the first point is taken as  $(x_0, y_0)$  and that it then moves up the line (e.g. each pixel is determined as shown in Fig. 3.5 based on the intersection with the actual pixel lines, and that on pages 75-76 that the algorithm as shown in Fig. 3.6 makes decision based on whether or not the edges cross the boundaries of the pixel – in some cases, the side boundaries, and in others, the top and bottom of the pixel, depending on whether or not the line had a slope greater or less than 1, such that any line that was written in  $x$  terms (e.g. instead of  $y = m * x + b$ , the line was written as  $x = m * y + b$ , the slope used in standard form would thus be  $1/m$  such that it was fractional, and such a line would be evaluated in terms of intersections with the top and bottom (border) of the pixel, as on pages 94-96 of Foley. On pages 96-97 in section 3.6.3, it is clearly set forth that the denominator would have a fractional part, and when the fractional part is zero, the pixel can be drawn, but that when it is nonzero that rounding must occur, as in the Bresenham algorithm. As such, this determination of the fraction – e.g. the determination of the intersection with the line, since determination of an  $x$ -coordinate with respect to a pixel only makes sense if the edge is evaluated for crossing the pixel in the first place, thusly accounting for the “determining” step as recited above.)

Art Unit: 2672

-For each edge that touches the bottom border of the first pixel, incrementing a first parameter by a difference between a right fill style and a left fill style of the edge, wherein the leftmost fill style in the scan line is set to null. (Foley clearly teaches on pages 95-96 that the values are incremented as the algorithm moves up the line, just as Bresenham suggests, but it keeps the coordinates without rounding them except as needed to make the judgment to which pixel the number should be rounded to, e.g. the rounding is done on the precise value, but the precise value is retained by the system such that once it is incremented, it can be checked again. On pages 95-96 in section 3.6.2 it is taught that slivers present a problem, and suggests on page 96 that a rule such as “draw only pixels that lie interior or on a left or bottom edge” (in this case the case of the bottom pixels is emphasized) would fulfill the recited limitation. Further, on pages 92-94, section 3.6 specifically, the use of a polygon filling algorithm that avoids problems with polygons overwriting each other’s pixels is taught and clarified in the context of the Bresenham / midpoint algorithm (pages 96-98).)

Finally, the incremented parameter would be x or y coordinate values for example, wherein the left and right fill styles would merely be the inside of a polygon – e.g. see page 93 of Foley, Fig. 3.23 the right fill style would be the style of the inside of the polygon and the left fill style would be the null areas shown around the polygon. Finally, the “difference between a right fill style and a left fill style of an edge” is a coordinate, as applicant does not claim and applicant’s specification does not provide evidence of using something other than a coordinate value in that role (e.g. some kind of RGB value or something similar). Lastly, the procedure of Bresenham is repeated for

every edge, so it would prima facie be performed for every edge in a given pixel.

Thusly, as shown by claims 2 and 3, the first parameter is nothing more than a fill style or color associated with a particular pixel, which would justify examiner's position that the recited parameter is merely a coordinate.

Motivation for combination is provided by the fact that Foley is merely serving as a teaching reference, e.g. Crisu teaches *inter alia* the use of the Bresenham algorithm in [0013-0016], and Foley in pgs. 73-81 merely explains how it works and its applications. Crisu further teaches in [0013] certain points about the operation of the Bresenham algorithm. As stated above, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the methods of Crisu and Bresenham.

As to claim 2, this claim merely recites the changing of a second parameter that clearly could represent changing the other coordinate of the pixel (e.g. the first parameter recited above could be the x-coordinate and the second parameter recited herein could be the y-coordinate). Also, as set forth in the filling algorithm recited in section 3.6 of Foley (pgs. 92-94), clearly the second fill style recited would be that of the area outside the polygon, since obviously the fill style in question is merely the color or texture of pixels inside of one polygon in for example Figs. 3.22 and 3.23(a) and (b) as set forth on pages 92-94. Fill style is nothing more and nothing less than the color and characteristics that a polygon or general screen is covered with. Motivation and combination is taken from the parent claim.



\*\*Examiner is treating claim 3 as being dependent upon claim 2 for the reasons discussed in the claim objections section above. If applicant wishes to dispute this point, applicant should so note in the response to this Office Action.

As to claim 3, the claim of a third and fourth pixel is comparable to Fig. 3.22 on Foley page 92 (as an example). Namely, scan line 8 is illustrated as crossing a polygon. Obviously, there are at least first and second pixels outside and inside the polygon where the first parameter would be the fill style of the inside of the polygon. The third parameter recited would merely be the coordinates of the edge that intersects the scan line at that point. Applicant's parent claim – claim 1 – states clearly that each scanline has multiple edges. Obviously, such edges would cross the scanline once each, and the third claim thusly requires multiple edges. Thus, each edge would have inside and outside pixels and fill styles, and thusly the recited clause of “for each edge in the third pixel” is nothing more than a recitation of claim 1 for another edge crossing the recited same scanline.

Let the algorithm work as is taught in section 3.6 and as in Crisu [0013-0016] where edge-walking is done for the polygon, such that as on page 92, the scan is walked across, in that each edge that crosses the scanline is noted and the appropriate pixels that belong on it are chosen such that one coordinate is incremented as the algorithm moves across the scanline – obviously, this could be the x or y coordinate (in the case of the image in Fig. 3.22 on page 92 it would be the x-coordinate), and obviously the recited third parameter would be the incremental increase in x-position that would be added or incremented to the counter variable holding the x-position on the scanline,

which would also be the recited "second parameter" such that it would mark the occurrence of an edge. Obviously, Fig. 3.22 illustrates that situation where the third pixel would be the point where the scanline crosses the polygon boundary again (e.g. pixels one and two would be found at point a and pixels three and four would be found at point b) and the fourth pixel would be filled with the "second fill style" that would be equal to the x- and y-coordinates of the scanline, e.g. the recited first fill style would be that of the polygon and the second fill style would be that of the null region or the outside of the polygon as illustrated in Figs. 3.22 and 3.23(a) and (b) and as explained above. Motivation and combination are taken from the parent claim.

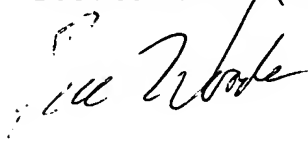
As to claim 4, it is merely one claim that contains all the limitations of claims 1-3 above. Therefore, all the limitations of this claim are taught in the rejections to claims 1-3 above, which are herein incorporated by reference in their entirety, and motivation and combination is thusly provided by claim 1 as stated above.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric V Woods whose telephone number is 571-272-7775. The examiner can normally be reached on M-F 7:30-4:30 alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi can be reached on 571-272-7664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Eric Woods

April 10, 2005

